

NRC Question Response Form

Request Number: 5.b

Status:

Requested By (Inspector name):Date Requested:Question / Document Request: Q D (circle one)System:Detailed Question or Request:

NRC Question:

If operators must close the moisture separator reheaters (MSRs), that would add 20 minutes to medium response timing for heater drain line breaks as described in Section 5.7 of Addendum 5 (HRA). This would result in a total time of 110 minutes (Tm plus T1/2). What would a sensitivity analysis show if this timing was used for this human error probability (HEP)?

Initiated By (individual taking the request): J. RitterAssigned To: Raymond DremelDate Assigned: July 13, 2010**CAP / Work Order Issued? Yes** **No** (circle one) Number: _____

Response:

A sensitivity analysis was performed to evaluate the impact of increasing the median response time by 20 minutes for operator action to isolate a heater drain line break-induced flood that actuates fire protection systems and causes failure of a cooling water line. This sensitivity evaluation involved two steps. First the human error probability (HEP) for each event was reevaluated using the increased median response time. Second, the core damage frequency (CDF) was calculated for each unit using the revised HEPs. The evaluations are detailed below.

Five basic events are used in the logic models to represent failure of operator action to isolate a flooding event caused by a high energy line break (HELB) of a heater drain line that causes actuation of fire protection systems and impacts a cooling water line. These events are:

ISO-H-H-LP-A--062,
ISO-H-H-LP-A--085,
ISO-H-H-LP-A-110,
ISO-H-H-LP-A-124, and
ISO-H-H-LP-A-130.

For each of these events, the median response time was changed from 76 minutes to 96 minutes. Then the impact of the timing change on execution dependency values was

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adjusted to represent the recommended values provided by the HRA Calculator software. These changes and the resulting HEP values are provided below.

Event ISO-H-H-LP-A--062 was initially calculated using a high dependency for execution recovery. The change in median response time resulted in a recommended dependency level of complete. Using a complete dependency for execution recovery resulted in a final HEP for this event of 0.9.

Event ISO-H-H-LP-A--085 was initially calculated using a high dependency for execution recovery. The change in median response time resulted in a recommended dependency level of high. Using a high dependency for execution recovery resulted in a final HEP for this event of 0.72.

Event ISO-H-H-LP-A-110 was initially calculated using a moderate dependency for execution recovery. The change in median response time resulted in a recommended dependency level of high. Using a high dependency for execution recovery resulted in a final HEP for this event of 0.52.

Event ISO-H-H-LP-A-124 was initially calculated using a low dependency for execution recovery. The change in median response time resulted in a recommended dependency level of high. Using a high dependency for execution recovery resulted in a final HEP for this event of 0.33.

Event ISO-H-H-LP-A-130 was initially calculated using a low dependency for execution recovery. The change in median response time resulted in a recommended dependency level of moderate. Using a moderate dependency for execution recovery resulted in a final HEP for this event of 0.24.

The base value of the total non-seismic core damage frequency (CDF) due to turbine building flooding events at-power for Prairie Island Nuclear Generating Plant (PINGP) Unit 1 is 2.59E-06 per year and 2.57E-06 per year for PINGP Unit 2 [Ref 1].

These values were incorporated into the rule-based recovery file and the models quantified. These changes caused the Unit 1 CDF to increase to 2.96E-06 per year and the Unit 2 CDF to increase to 2.94E-06 per year, an increase of 14% and 14%, respectively.

References:

1. V.SPA.10.008, Addendum 6, "Turbine Building HELB/Internal Flooding Significance Determination Process: Non-Seismic Quantification Analysis", Rev 0.

Is this an equipment issue that affects plant operability? Yes No

If yes, contact the Shift Manager immediately. N/A

Date/Contacted By

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Completed By: Raymond Drenel per email J.Rittin Date Completed: 7/15/10
 Peer / Tech Review / Validation By: Todd Reichardt per email (quantification)
Char Greene per email (HEP) Date Completed: 7/15/10
 Team Leader / Supervisor Review / Approval: [Signature] Date Completed: 7-16-10

Additional Info Attached? Yes / No [forward a copy to Regulatory Affairs]

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Reviewer Verification Guidance

- Data Requests:
 - Is the information provided complete? Was any material removed from the information provided?
 - Is the information provided correct? Was the preparer of the response a subject matter expert?
- Information Requests:
 - Does the response answer the question being asked? Is the response on topic and clear?
 - Are inputs and assumptions appropriately validated?
 - If there is an embedded calculation, is the math correct?
 - Is the response well formulated? Was enough work put into the response?
 - Does the response reflect a differing professional opinion between the preparer and the inspector? Is the response professional in tone? Is the response argumentative?
 - Is there a condition adverse to quality? Has a CAP been initiated?